

ABSTRACT OF THE DISCLOSURE

A bi-directional silicon controlled rectifier formed in a silicon layer and disposed over shallow trench isolations and therefore electrically isolated from the substrate to be insensitive to substrate noise for electrostatic discharge protection an electrostatic discharge protection device that includes a semiconductor substrate, including a first p-type portion, a first n-type portion contiguous with the first p-type portion, a second p-type portion contiguous with the first p-type portion and the first n-type portion, a second n-type portion, a third p-type portion, a third n-type portion contiguous with the third p-type portion, and a fourth p-type portion contiguous with the third p-type portion and the third n-type portion, wherein at least one of the first p-type portion, second p-type portion, third p-type portion, fourth p-type portion, first n-type portion, second n-type portion, and third n-type portion overlaps the isolation structure.

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